FINAL
ENVIRONMENTAL ASSESSMENT
FOR THE
FACILITY CONSTRUCTION AND OPERATION
OF THE
RESEARCH AND DEVELOPMENT ENGINEERING CENTER (RDEC)
TEST AND EVALUATION LABORATORY SUPPORT FACILITY

REDSTONE ARSENAL, ALABAMA

U.S. ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA

MARCH 2000

March 20, 2000

**FINDING OF NO SIGNIFICANT IMPACT (FNSI)
FOR THE ENVIRONMENTAL ASSESSMENT FOR THE
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BACKGROUND: The Army proposes to construct and operate a Research Development and Engineering Center (RDEC) Test and Evaluation Laboratory Support Facility located on the south side of Fowler Road due south of McMorrow Laboratories at Redstone Arsenal, Alabama. The facility will consolidate the manufacturing and prototype operations of RDEC into one building. These functions are currently performed in seven separate buildings on the Installation, and considerable time is lost commuting between the buildings and transporting prototyped hardware. The geographic separation precludes effective and efficient operation of a wide variety of mission functions. Additionally, occupational health directives have mandated the replacement/upgrade of the existing HVAC system in Building 4762, currently occupied by RDEC.

DESCRIPTION OF THE PROJECT: The project would include the construction of a 59,800 square foot building encompassing 10-15 acres of land. Construction would consist of a prototype integration facility to include a shop assembly area; high bay area with reinforced concrete floor; a containment system for vehicle exhaust and fuel; engineering laboratory; clean room facility; engineering workspace; conference rooms; computer rooms and computer aided design space; latrines; and support areas. All machine shop equipment will be relocated to the proposed facility. The design will provide a receiving, supply, and staging area with a loading dock for heavy equipment, and will include a jib crane. Independent environmental controls will be installed for heat, air conditioning, and humidity control. In addition, ventilation, filtration and pressurization of the labs and computer areas would be included in the design. The construction of the facility will provide utilities to include water, sewer, gas, and electric. A communication system, intrusion detection with CCTV (closed circuit television), fire protection and FM (frequency modulated) fire alarm will also be provided. The supporting facilities would include site grading and preparation, storm drainage, paved parking, sidewalks, curbs and gutters, and access roads. An 11,400 square foot hardstand with secure fenced parking for tactical vehicle and high value project assets and two overhead 15-ton cranes will also be included in the design of the laboratory. The facility would be constructed so that it is easily accessible to accommodate the handicapped. Exterior lighting, site improvements, and largely native landscaping will be included in the design. Force

protection would be provided with berms, bollards, anchored window frames, and tempered glass in exterior windows.

The general construction site is located in the eastern portion of the Arsenal due south of McMorrow Laboratories on the south side of Fowler Road. The facility would be located in the RDEC "Corridor of Excellence."

ALTERNATIVES CONSIDERED: In addition to the Proposed Action, alternative sites were considered as well as the No-Action Alternative. Three additional construction sites were evaluated against the site selection criteria, and eliminated from further consideration. The criteria required that the site:

- allow for consolidation and close proximity to all RDEC facilities,
- allow for an increased traffic flow, including 18-wheeler transport trucks,
- have an existing infrastructure for electricity, sewer, etc., and
- have minimal impacts to the environment.

The alternative construction sites considered for the RDEC facility include:

- a location at the northeastern corner of the Mills and Fowler Road intersection
- a location on Fowler Road to the west of the proposed site location, and
- in the fenced area on the east side of Building 5400.

The two Fowler Road locations may potentially have significant environmental impacts and/or impact cultural resources in the area, and the location on the east side of Building 5400 does not provide an adequate area for construction of the Proposed facility. Constructing this facility at one of these locations would appear to have no economic or ecological rationale.

Alternative 2 No-Action Alternative: This alternative would require that the Army leave the existing operations as they are now. The excessive maintenance and energy costs currently required with the current buildings would escalate to the detriment of mission accomplishment. Under this alternative, health, safety, and personnel morale would be compromised, and there would be a continued loss of valuable personnel time in travel.

ENVIRONMENTAL EFFECTS: Eleven broad environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the significance of potential impacts. The areas of environmental consideration are air quality, biological

resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources. Cumulative impacts of this Proposed Action were also analyzed.

Mitigation measures for the Proposed Action are not required for land use and socioeconomics as no impacts have been identified for these resources. Impacts to the other environmental resources that were determined are considered to be not significant and mitigable. No cumulative impacts under this alternative were identified.

The alternatives to the Proposed Action were not considered to be as beneficial and have the potential to create adverse environmental impacts. The alternative site locations did not meet all of the selection criteria established by the Master Planning Office. Alternative 2 - The No-Action Alternative would require that the Army leave the existing operations as they are now. Excessive maintenance and energy costs currently required with the current buildings would escalate to the detriment of mission accomplishment. Under this alternative, health, safety, and personnel morale would be compromised, and there would be a continued loss of valuable personnel time in travel.

CONCLUSION: The Directorate of Environment and Public Works (DEPW) has prepared an Environmental Assessment that addresses the proposed project and evaluates the environmental impacts of the proposed project based on the conclusion of the Environmental Assessment for the Facility Construction and Operation of the Research and Development Engineering Center (RDEC) Test And Evaluation Laboratory Support Facility, Redstone Arsenal, Alabama, March 20, 2000. We conclude that there would be no significant environmental impacts associated with this project that would require the publication of an Environmental Impact Statement.

DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA

FINDING OF NO SIGNIFICANT IMPACT (FNSI) FOR THE FACILITY CONSTRUCTION AND OPERATION OF THE RESEARCH AND DEVELOPMENT ENGINEERING CENTER (RDEC) TEST AND EVALUATION LABORATORY SUPPORT FACILITY REDSTONE ARSENAL, ALABAMA

PREPARED MARCH 20, 2000

PROPONENT OF THE ACTION:

_____Date_____

JOE L. DAVIS
Chief, Master Planning Division

PREPARED BY:

_____Date_____

MARK D. BURROUGHS
Master Planning Division,
Directorate of Environment and Public Works

REVIEWED BY:

_____Date_____

AMY MEREDITH
Attorney Advisor

REVIEWED BY:

_____Date_____

ROBERT J. SPAZZARINI
AMCOM Chief Counsel

APPROVED BY:

_____Date_____

JERRY M. HUBBARD
AMCOM Environmental Officer

REVIEWED BY:

_____Date_____

DANIEL J. DUNN
Natural Resources Team Leader
Directorate of Environment and Public Works

REVIEWED BY:

_____Date_____

CAROLENE WU
NEPA Coordinator
Directorate of Environment and Public Works

FINAL APPROVAL BY

_____Date_____

JULIAN A. SULLIVAN, JR.
Major General, USA
Commanding

EXECUTIVE SUMMARY

INTRODUCTION

The Redstone Arsenal Research and Development Engineering Center (RDEC) Prototype Engineering Division and Fabrication Facilities are currently located in seven separate buildings on the Arsenal. The mission of the Prototype Engineering Division is to design and fabricate prototype missile systems and major subsystems in support of the Army Missile Laboratory, Project Offices, and other Government agencies. Additionally, it performs advanced systems engineering and integration on assigned in-house missile development programs and provides prototype electrical and mechanical fabrication capability including assembly and verification. Finally, it provides functional support including development of test requirements, development of specifications and engineering documentation and a design/fabrication capability for implementing ideas to hardware tasks for Army user and Project Manager elements. This project would consolidate the prototype and manufacturing facilities, and would locate the operations within the RDEC "Corridor of Excellence."

DESCRIPTION OF THE PROJECT

The project would include the construction of a 59,800 square foot building encompassing 10-15 acres of land. Construction would consist of a prototype integration facility to include a shop assembly area; high bay area with reinforced concrete floor; a containment system for vehicle exhaust and fuel; engineering laboratory; clean room facility; engineering workspace; conference rooms; computer rooms and computer aided design space; latrines; and support areas. All machine shop equipment will be relocated in the proposed facility. The design will provide a receiving, supply, and staging area with a loading dock for heavy equipment, and will include a jib crane. Independent environmental controls will be installed for heat, air conditioning, and humidity control. In addition, ventilation, filtration and pressurization for the labs and computer areas will be included in the design. The construction of the facility will provide utilities to include water, sewer, gas, and electric. A communication system, intrusion detection with CCTV (closed circuit television), fire protection and FM (frequency modulated) fire alarm will also be provided. The supporting facilities would include site grading and preparation, storm drainage, paved parking, sidewalks, curbs and gutters, and access roads. An 11,400 square foot hardstand with secure fenced parking for tactical vehicle and high value project assets and two overhead 15-ton cranes would also be included in the design of the laboratory. The facility would be constructed so that it is easily accessible to accommodate the handicapped. Exterior lighting, site improvements, and largely native landscaping would be included in the design. Force protection would be provided with berms, bollards, anchored window frames, and tempered glass in exterior windows.

The general construction site is located in the eastern portion of the Arsenal south of Fowler Road and due south of McMorrow Laboratories. The facility would be located in the RDEC "Corridor of Excellence."

METHODOLOGY

The purpose of this Environmental Assessment (EA) is to analyze the potential environmental consequences of the Proposed Action and the alternatives in compliance with the National Environmental Policy Act; DoD Directive (DoDD) 6050.1, *Environmental Effects in the United States of Department of Defense Actions*; and Army Regulation (AR) 200-2, *Environmental Effects of Army Actions*.

Eleven environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the significance of potential impacts. These areas are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

To assess the significance of environmental impacts, a list of activities necessary to accomplish the Proposed Action was developed. The environmental setting was then described and those activities with the potential for environmental consequences were identified. The significance criteria used to evaluate the environmental effects of program activities include three levels of impacts: no impact, not significant impact, and significant impact.

RESULTS

This section summarizes the conclusions of the analyses made for each of the 11 areas of environmental consideration based on the application of the described methodology.

AIR QUALITY

Fugitive dust and combustion emissions would be generated during the construction activities, and air emissions would be generated from the painting processes. Construction-related emissions of fugitive dust and exhaust products would depend on the amount of earthwork to be done and the construction mobilization schedule. Fugitive dust from ground-disturbing activities can be reduced up to 50 percent by regular site-watering practices as necessary. Operational emissions generated during the painting processes would occur in the paint booths, and would be ventilated through air filters. Projected impacts to air quality from construction activities are not expected to be significant because fugitive dust and combustion emissions can be mitigated. The painting operations are subject to National Ambient Air Quality Standards (NAAQS), and are not expected to exceed threshold levels.

BIOLOGICAL RESOURCES

Vegetation - The immediate construction area for the Proposed Action consists of predominantly pine trees of various ages. Some hardwood stands exist on the outer boundary of the construction area of the Proposed Action. Prior to construction, the pine timber stand would be available for harvest. During construction activities, existing trees located on the site of the Proposed Action would be saved if their trunks are five inches in diameter or greater and they are determined to be healthy. All other trees that were not harvested would be saved if they do not interfere with planned construction. Trees to be saved would have three stakes at least ten feet away from the trunks with barrier flagging stretched around all three to protect the trees from construction equipment. None of the hardwood trees would be removed from the site. Projected impacts to these biological resources from construction activities are not expected to be significant if the mitigation measures proposed in this document are implemented.

Fish and Wildlife - Vista Technologies Inc. conducted a site survey over the area considered for the Proposed Action. Suitable habitat for a variety of wildlife species is present in the area of the Proposed Action, however the site of the Proposed Action does not appear to support extensive wildlife. Common forest species such as small mammals and birds are expected to inhabit the area. A detailed description of bird and wildlife species having the potential to exist in the Proposed Action area can be found in the Natural Resources Management Plan for Redstone Arsenal (1995). Since the Proposed Action area does not appear to support extensive wildlife habitat, and because the closest

stream resource (Huntsville Spring Branch) is approximately 1 mile to the south of the proposed construction site, no significant impacts are expected to these biological resources.

Aquatic Habitats - The closest aquatic resource to the Proposed Action site is a tributary of Huntsville Spring Branch located approximately 2400' to the south of the proposed construction site on Fowler Road. Although runoff would flow south, implementation of best management practices by the construction contractors (e.g., silt fencing, hay bales) would mitigate any potential impacts. Since the Proposed Action site does not contain any permanent pools, ponds, streams, or lakes and does not support habitat for aquatic organisms, there are no impacts expected to these biological resources.

Threatened and Endangered Species, Wetlands, and Unique Habitats - No threatened and/or endangered species, wetlands, or unique habitats are located on the Proposed Action site. There would be no impacts to these biological resources from the Proposed Action. Wheeler National Wildlife Refuge is located 4800' to the south of the Proposed Action site, and all construction runoff will flow that direction. Implementation of best management practices by the construction contractors (e.g., silt fencing, hay bales) would mitigate any potential impacts.

CULTURAL RESOURCES

According to the Alabama State Historic Preservation Office there are no archaeological sites or structures eligible for listing on the National Register located in the Proposed Action area. The project area has been surveyed, and no archaeological sites or structures were identified in the Proposed Action area. Jordan Cemetery is located near the Proposed Action area, however, a 100-foot buffer zone around the cemetery would be observed during the construction and operation of the facility. Therefore, there would be no impact to cultural resources. If, during construction activities, items are observed that might have historical or archaeological value, such observations shall be reported immediately to the Cultural Resources staff of the Directorate of Environment and Public Works (DEPW) so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made.

HAZARDOUS MATERIALS AND WASTE

No hazardous materials would be used during the construction activities, and a limited amount of hazardous materials would be used during normal operations at the facilities. Solvents such as lacquer thinner and mineral spirits would be used as well as conformal coating and epoxy paints. Any hazardous waste would be identified, removed in accordance with current regulations, and disposed of following existing regulations. No hazardous waste would be disposed of on-site. Impacts from the Proposed Action are not considered to be significant and are mitigable.

HEALTH AND SAFETY

Using established safety procedures would minimize potential impacts to health and safety from Proposed Action activities. OSHA is responsible for protecting worker health and safety in non-military workplaces. OSHA regulations are found in 29 CFR 1910. Protection of public health and safety is an EPA responsibility and mandated through a variety of laws such as the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act/ Superfund Amendments and Reauthorization Act (CERCLA/SARA), the Clean Water Act (CWA) and the Clean Air Act (CAA). EPA regulations are found in 40 CFR 265.382. Additional safety responsibilities are placed on the DOT in 49 CFR.

Army Regulation 385-100, *Safety*, and all appropriate Occupational Safety and Health Administration regulations including 29 Code of Federal Regulations Part 1926, *Safety and Health Regulations for Construction*, would be followed during the course of construction and the operational activities. The selected building contractor would obtain a National Pollutant Discharge Elimination System (NPDES) construction permit from the Alabama Department of Environmental Management. The selected building contractor would comply with the NPDES construction permit requirements as well as all applicable federal, state, local laws and regulations when constructing any structures. Best Management Practices must be used in all construction activities. Impacts to health and safety from the Proposed Action are not considered to be significant and are mitigable.

INFRASTRUCTURE AND TRANSPORTATION

As the existing infrastructure is adequate to supply the proposed new facility, there would be no need to supply extensive new systems for electrical and natural gas, water, wastewater treatment, or solid waste disposal. Infrastructure impacts could occur, however, due to periodic short-term interruptions in service as the new facility is constructed. The existing transportation (roadway) system would be adequate to serve the proposed development but could have short-term interruptions in use as construction and operational activities occur. Occasional tractor-trailer and tank traffic would occur during the normal operations of this facility. The contractor has the option of using the existing roadway pattern or designing a new system. If changes occur, interruptions to service would be likely. These short-term interruptions in service are not considered a significant impact. Scheduled interruptions in utility service or the roadway system serving the immediate area would need to be scheduled in advance. Projected impacts to infrastructure and transportation from construction and operational activities are not expected to be significant as the concerns regarding utility and traffic rerouting and the short-term interruptions in utility service can be mitigated.

LAND USE

There would be no impacts to land use due to the construction and operation of the facility associated with the Proposed Action. The Proposed Action is consistent with current Installation land use plans.

NOISE

Noise sources that may occur as a result of the Proposed Action include construction and operational activities such as construction vehicle traffic, occasional tank traffic, and diesel generators. Projected noise impacts from these activities are expected to be short-term and not significant because reductions in noise activities and confinement of noise producing activities to normal workday hours would mitigate the concerns.

GEOLOGY AND SOILS

Impacts to geology and soils due to activities associated with the Proposed Action are not expected to be significant. Soils disturbed during construction activities of the Proposed Action would be revegetated as soon as possible after construction to prevent soil loss. Erosion control during construction activities must be undertaken with the use of hay bales and silt fencing to prevent the movement of soils into drainage ditches or low-lying areas.

SOCIOECONOMICS

The population of the overall area would not be affected (since there would be no population increase), however the regional employment outlook and area income would slightly increase due to the construction and operation of the facility. Over the next few years, the number of personnel employed at this RDEC facility is projected to increase by 50%.

WATER RESOURCES

No impacts would be expected to groundwater resources as a result of the Proposed Action because there would be no change to the general types of activities in the area. There would be potential impacts to surface water resources during the construction period, however these impacts are not expected to be significant and are mitigable. Soils disturbed during construction activities could potentially be washed into drainage ditches or low-lying areas. Erosion controls during construction activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils via surface waters.

CONCLUSION

The most beneficial alternative, using data supplied by the U.S. Army, Redstone Arsenal (pers. comm., Mark Burroughs, DEPW, Master Planning), is Alternative 1, the Proposed Action. There are no significant impacts to environmental resources under this alternative, and the impacts to the environment that were determined are considered to be minor and mitigable. No cumulative impacts under Alternative 1 have been identified.

Locating the facility elsewhere on the Arsenal does not meet the selection criteria required by Master Planning, and these alternatives were eliminated from further consideration. The Fowler Road location is adjacent to a cemetery, and cultural resources could potentially be disturbed. The fenced-in area on the east side of Building 5400 does not provide sufficient area for construction and operation of this facility. The northeastern corner of Fowler and Mills Road is located adjacent to a closed industrial and sanitary landfill, and construction and operation of a facility in this area may disturb the landfill. Furthermore, moving these activities to one of these locations would appear to have no economic or ecological rationale.

Alternative 2, the No-Action Alternative, requires that the Army leave the existing operations as they are now. The excessive maintenance and energy costs currently required with the current buildings will escalate to the detriment of mission accomplishment. Under this alternative, health, safety, and personnel morale will be compromised, and there will be a continued loss of valuable personnel time in travel.

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CHAPTER 1 NEED FOR AND PURPOSE OF PROPOSED ACTION

1.1 INTRODUCTION

The National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), Department of Defense (DoD) Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions* (U.S. Department of Defense, 1979), and Army Regulation (AR) 200-2, *Environmental Effects of Army Actions* (U.S. Department of the Army, 1988), which implements these laws and regulations, direct DoD and Army officials to consider environmental consequences when authorizing or approving federal actions. Accordingly, this Environmental Assessment (EA) analyzes the environmental consequences of the Construction and Operation of project.

Section 1.0 of this EA discusses the background for this action, gives a brief description of the Proposed Action, introduces the purpose of and need for the action, notes the location of the project, and highlights issues raised during the assessment process. Section 2.0 discusses project alternatives including the Proposed Action and compares the environmental consequences of the various alternatives. Section 3.0 describes the affected environment at the location of the Proposed Action. Section 4.0 assesses the potential environmental consequences of implementing the Proposed Action and alternatives; it also highlights cumulative impacts and mitigation measures for each resource. Section 5.0 highlights the conclusions of the EA. Section 6.0 contains a list of individuals involved in the preparation of this EA. Section 7.0 lists the individuals and agencies consulted during the preparation of this EA and the agencies, organizations, and individuals that were sent a copy of the EA. Section 8.0 contains a list of the references used to prepare this document. Appendix A contains copies of consultation letters regarding this project.

1.2 BACKGROUND

Redstone Arsenal (RSA) is located in Madison County, southwest and adjacent to the City of Huntsville, Alabama (Figure 1-1). The Arsenal occupies approximately 38,000 acres of land and employs approximately 21,500 government and contractor personnel.

1.2.1 Description of the Proposed Action

The proposed project would include the construction of a 59,800 square foot building encompassing 10-15 acres of land. Construction would consist of a prototype integration facility to include a shop assembly area; high bay area with reinforced concrete floor; a containment system for vehicle exhaust and fuel; engineering laboratory; clean room facility; engineering workspace; conference rooms; computer rooms and computer aided design space; latrines; and support areas. All machine shop equipment will be relocated into the proposed facility. The design will provide a receiving, supply, and staging area with a loading dock for heavy equipment, and will include a jib crane. Independent environmental controls will be installed for heat, air conditioning, and humidity. In addition, ventilation, filtration and pressurization for the labs and computer areas will be included in the design. The construction of the facility will provide utilities to include water, sewer, gas, and electric.

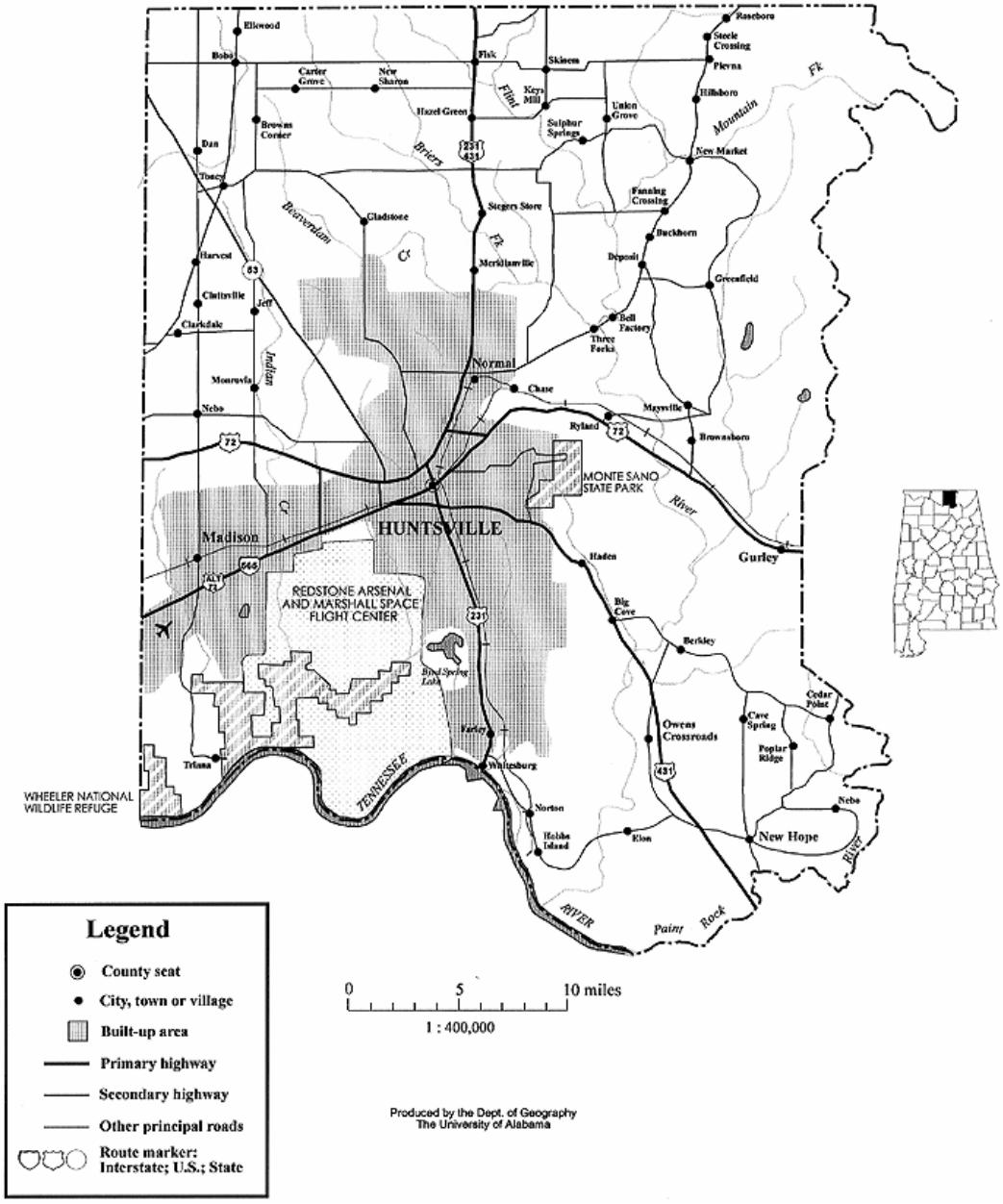

Figure 1-1. Redstone Arsenal Vicinity Map

Additionally, a communication system, intrusion detection with CCTV (closed circuit television), fire protection and FM (frequency modulated) fire alarm will be provided. The supporting facilities would include site grading and preparation, storm drainage, paved parking, sidewalks, curbs and gutters, and access roads. An 11,400 square foot hardstand with secure fenced parking for tactical vehicle and high value project assets and two overhead 15-ton cranes will also be included in the design of the laboratory. The facility would be constructed so that it is easily accessible to accommodate the handicapped. Exterior lighting, site improvements, and largely native landscaping will be included in the design. Force protection would be provided with berms, bollards, anchored window frames, and tempered glass in exterior windows.

The general construction site is located in the eastern portion of the Arsenal, south of Fowler Road, and due south of the McMorrow Laboratories. The facility would be located in the RDEC "Corridor of Excellence."

1.2.2 Purpose and Need for the Action

The purpose of this action is to construct and operate a Research Development and Engineering Center (RDEC) Test and Evaluation Laboratory Support Facility. The facility will consolidate the manufacturing and prototype operations into one building. These functions are currently performed in seven separate buildings on the Installation, and considerable time is lost commuting between the buildings and transporting prototyped hardware. The geographic separation precludes effective and efficient operation of a wide variety of mission functions. In addition, occupational health directives have mandated the replacement/upgrade of the existing HVAC system in Building 4762.

1.2.3 Location

The general construction site is located in the eastern portion of Redstone Arsenal south of Fowler Road and due south of McMorrow Laboratories. Figure 1-2 presents a location map of the Proposed Action site.

1.3 RELATED ENVIRONMENTAL DOCUMENTATION

A list of related environmental documentation reviewed during the preparation of this EA is shown below.

Final Environmental Assessment for Redstone Arsenal Master Plan Implementation. U.S. Army Missile Command, Redstone Arsenal, Alabama. December 1994.

Natural Resources Management Plan for Redstone Arsenal, Parts I, II, III, IV, V, VI. July 1995.

Real Property Master Plan, Land Use Analysis, Redstone Arsenal, Alabama. Directorate of Environmental Management and Planning, Redstone Arsenal, Alabama. April 1999.

1.4 AGENCIES INVOLVED IN ENVIRONMENTAL ANALYSIS

The Alabama State Historic Preservation Office (SHPO), the U.S. Fish and Wildlife Service (USFWS), and the Environmental Protection Agency (EPA) have been consulted in an effort to determine their concerns regarding the Proposed Action. Consultation letters from these agencies, regarding the Proposed Action, are located in Appendix A.

Figure 1-2. Proposed Action Site Location.

1.5 PUBLIC INVOLVEMENT

Public involvement would take place at the completion of this EA process. A 30-day comment period follows the publication in the local newspaper of the Notice of Availability of the Facility Construction and Operations of the Research and Development Engineering Center (RDEC) Test and Evaluation Laboratory Support Facility EA. Other federal, state, and local agencies are not currently involved in the planning of this action.

There were no significant environmental impact issues determined through this EA process. All issues raised during the scope of the process have been identified within this assessment.

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 SUMMARY OF ALTERNATIVES

During the planning stages for the Facility Construction and Operation of the RDEC Test and Evaluation Lab Support Facility, several alternatives were considered. These alternatives were assessed for their potential impacts to the environment and are described in the following sections.

2.2 DESCRIPTION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.2.1 Alternative 1 - Proposed Action

The Proposed Action is to construct a 59,800 square foot building encompassing 10-15 acres of land. Construction would consist of a prototype integration facility to include a shop assembly area; high bay area with reinforced concrete floor; a containment system for vehicle exhaust and fuel; engineering laboratory; clean room facility; engineering workspace; conference rooms; computer rooms and computer aided design space; latrines; and support areas. All machine shop equipment will be relocated into the proposed facility. The design will provide a receiving, supply, and staging area with a loading dock for heavy equipment, and will include a jib crane. Independent environmental controls will be installed for heat, air conditioning, and humidity. Additionally, ventilation, filtration and pressurization for the labs and computer areas will be included in the design. The construction of the facility will provide utilities to include water, sewer, gas, and electric. Additionally, a communication system, intrusion detection with CCTV, fire protection and FM fire alarm will be provided. The supporting facilities would include site grading and preparation, storm drainage, paved parking, sidewalks, curbs and gutters, and access roads. An 11,400 square foot hardstand with secure fenced parking for tactical vehicle and high value project assets and two overhead 15-ton cranes will also be included in the design of the laboratory. The facility would be constructed so that it is easily accessible to accommodate the handicapped. Exterior lighting, site improvements, and largely native landscaping will be included in the design. Force protection would be provided with berms, bollards, anchored window frames, and tempered glass in exterior windows.

The general construction site is located in the eastern portion of Redstone Arsenal south of Fowler Road and due south of McMorrow Laboratories.

2.2.2 No-Action Alternative

The No-Action Alternative would require that the Army leave the existing operations as they are now. The excessive maintenance and energy costs currently required with the current buildings will escalate to the detriment of mission accomplishment. Under this alternative, health, safety, and personnel morale will be compromised, and there will be a continued loss of valuable personnel time in travel.

2.2.3 Alternatives Eliminated From Further Consideration.

There were three additional site location alternatives considered that were eliminated from further consideration. All of the sites were considered against the site selection criteria. The criteria required that the site:

- allow for consolidation and close proximity of all RDEC facilities,
- allow for an increased traffic flow, including 18-wheeler transport trucks,
- have an existing infrastructure for electricity, sewer, etc., and
- have minimal impacts to the environment.

None of these alternative sites fully satisfied the requirements of the selection criteria. Additionally, locating the RDEC facility at the considered locations on Redstone Arsenal would not appear to reduce environmental impacts below the levels anticipated at their current sites. Furthermore, each of these alternatives has the potential to significantly impact the environment. A brief synopsis of these alternatives follows.

Location at the Northeastern Corner of the Intersection of Fowler and Mills Road.

This alternative would locate the RDEC facility adjacent to a closed industrial and sanitary landfill. Construction and operation of a facility in this could potentially disturb the landfill. The landfill was primarily used for the disposal of sanitary wastes, but DDT was also disposed there. Between 1968 and 1973, pesticides and pesticide-contaminated soil and debris were also disposed at the site. The DDT and pesticides were removed and disposed in another landfill, yet the sanitary waste remains in shallow covered trenches. Recent groundwater and soil samples indicate contamination including metals and organic contaminants such as volatile aromatic compounds, chlorinated hydrocarbons, chlorinated benzene compounds, PAHs, pesticides, arsenic, chromium, and lead. (pers. comm., Ken Hewitt, DEMP, Installation Restoration)

Location West of Mills Road on Fowler Road.

This alternative would locate the RDEC facility within the 100-foot buffer zone of Moore-Landman Cemetery. Activities in this area may disturb the ground in which an archaeological site is present, and it can destroy temporally and culturally diagnostic artifacts and features or alter artifact provenance.

Located in the Fenced Area on the East Side of Building 5400.

This alternative does not provide an adequate area to construct and operate the proposed RDEC facility.

CHAPTER 3 AFFECTED ENVIRONMENT

This section describes the environmental resources that may be affected by the Proposed Action. The affected environment is described in order to provide a context for understanding the potential impacts. Those components of the affected environment that are of greater concern relevant to the potential impacts are described in greater detail.

Available literature (such as EAs and Installation master plans) was acquired, and data gaps (questions that could not be answered from the literature) were identified. To fill the data gaps and to verify and update available information, Installation personnel were contacted. Cited literature is presented in Section 8.0.

Eleven broad environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the significance of potential impacts. Federal and/or state environmental statutes, many of which set specific guidelines, regulations, and standards, regulate several of these environmental components. These standards provide a benchmark that assists in determining the significance of environmental impacts under the NEPA evaluation process. The compliance status of the project area with respect to environmental requirements was included in the information collected on the affected environment. The areas of environmental consideration were air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

3.1 AIR QUALITY

3.1.1 Region of Influence

The region of influence (ROI) for air quality is the Proposed Action area and the immediately surrounding area.

3.1.2 Affected Environment

The Air Quality Act of 1967, commonly referred to as the Clean Air Act (CAA), was designed to protect and enhance the quality of the Nation's air resources. This Act, along with amendments adopted in 1970, 1977, and 1990, serves as the basis for air quality standards. The National Ambient Air Quality Standards (NAAQS), which were established by the Environmental Protection Agency (EPA) and mandated by the CAA, are the standards for ambient concentrations of the criteria pollutants: sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM-10), particulate matter with an aerodynamic diameter less than 2.5 microns, and lead (Pb). The NAAQS concentrations are ceilings that may not be exceeded. The NAAQS and Alabama Air Quality Standards are shown in Table 3-1. Areas are classified in one of three categories:

- Attainment - better air quality than required by standards;
- Non-attainment - worse air quality than required by standards; and
- Attainment unclassified - insufficient data available for the area to warrant non-attainment status and justify attainment status.

Table 3-1. NAAQS and Alabama Ambient Air Quality Standards (Same Figures)

Pollutants	Averaging Period	Primary Ambient Air Quality Standards (μg/m3)	Secondary Standard (μg/m3)
Sulfur Dioxide	3 hours 24 hours Annual	--- 365 80	1,300 --- ---
Particulates < 2.5 μm (PM-2.5)	24 hours Annual	65 15	65 15
Particulates < 10 μm (PM-10)	24 hours Annual	150 50	150 50
Carbon Monoxide	1 hour 8 hours	40,000 10,000	--- ---
Ozone	8 hours	157	157
Nitrogen Dioxide	Annual	100	100
Lead	Calendar quarterly Mean	1.5	1.5

The State of Alabama and the City of Huntsville have adopted the NAAQS. Redstone Arsenal is located in Madison County, which is in the Tennessee River Valley - Cumberland Mountains Air Quality Control Region. The Madison County area has an attainment unclassified designation for all primary and secondary pollutant standards stipulated under the NAAQS. (U.S. Army Missile Command, 1994)

The State of Alabama issues air permits for RSA. Operations subject to air permit regulations include boilers, petroleum storage tanks, and a propellant sparging unit. Each permitted emission source on RSA is in compliance with the terms of the permit. (U.S. Army Missile Command, 1994)

Redstone Arsenal has an established contract for refuse disposal at the Waste-to-Energy Plant operated adjacent to the Arsenal by the City of Huntsville. The city is responsible for air emission permitting and compliance of the facility. The plant burns up to 690 tons of garbage per day including household, industrial, and commercial waste. Hazardous or contaminated wastes are not accepted. (U.S. Army Missile Command, 1994)

There are approximately 23,400 privately owned vehicles transporting employees and visitors onto RSA daily. No state or local requirements for emissions testing of these vehicles exist. In recent years, traffic delays and tie-ups during peak hours have become noticeable. This situation results in increased vehicle emissions; however, air quality monitoring has not identified automotive emissions as presenting an impact to meeting attainment standards in the region. (U.S. Army Missile Command, 1994)

In the specific area of the Proposed Action there are no existing facilities that create significant air pollution.

3.2 BIOLOGICAL RESOURCES

3.2.1 Region of Influence

The ROI for biological resources is the land within the range of the Proposed Action project area.

3.2.2 Affected Environment

Several federal and state agencies oversee various aspects of biological resource management. The Endangered Species Act declares that it is the policy of Congress that all federal departments and agencies shall seek to conserve endangered and threatened species. Further, the act directs federal agencies to use their authorities in furtherance of the purposes of the Act.

3.2.3 Vegetation

Redstone Arsenal is within the southern portion of a region dominated by oak-hickory forest and other hardwood species. Most of this native forest has been cut for timber or cleared for other uses. The Proposed Action site is situated south of Madkin Mountain in the eastern portion of Redstone Arsenal. Stands of loblolly pines are located throughout the area of the ROI. Hardwood stands are found on the northern marginal area of the ROI.

3.2.4 Fish and Wildlife

The wide range of terrestrial and aquatic habitats, and the large size of the Arsenal, results in the use of the area by various wildlife species. Various wildlife such as deer, rabbit, or fox are occasionally sighted as they transit the Arsenal. More than 250 species of birds are known to occur on the Arsenal and do transit the area occasionally. Large nesting habitats are not prevalent. The closest aquatic resource to the Proposed Action site is Wheeler National Wildlife Refuge (WNWLR) and Huntsville Spring Branch (HSB), located approximately 1 mile to the south of the proposed construction site. Therefore, there are no fish or other aquatic life located in the area of the Proposed Action. (U.S. Army Missile Command, 1994)

Vista Technologies Inc. conducted a site survey over the area considered for the Proposed Action. The vegetation of the proposed site is composed primarily of pines with hardwood stands bordering the northern boundary of the area. Suitable habitat for a variety of wildlife species is present in the area of the Proposed Action, however the site does not appear to support extensive wildlife.

The available habitat was suitable for a variety of common forest wildlife, yet no species were observed during the site visit. Common forest species such as small mammals and birds are expected to inhabit the area. A detailed description of bird and other wildlife species that have the potential to exist in the area of the Proposed Action can be found in the Natural Resources Management Plan for Redstone Arsenal (U.S. Army Missile Command, 1995).

3.2.5 Aquatic Habitats

The closest aquatic resource to the Proposed Action site is HSB, located approximately 1 mile to the south of the proposed construction site. The ROI contains an open drainage ditch that can carry storm water runoff during wet periods. No studies are available that address the impacts of this runoff into water resources. This ditch is dry for the majority of the year and does not support permanent aquatic organisms. The ROI contains no ponds, pools, lakes or streams. There are no aquatic habitats on the Proposed Action site.

3.2.6 Threatened and Endangered Species

Biological resources warranting special protection include threatened and endangered species. Under the Endangered Species Act, federal agencies are prohibited from jeopardizing threatened or endangered species or adversely modifying habitats essential to their survival. According to information collected by the Alabama Natural Heritage Program (October 1995) and Mr. Daniel Dunn of the Redstone Arsenal Directorate of Environment and Public Works (DEPW), the project area has been surveyed and no threatened or endangered species are located in or near the Proposed Action site.

3.2.7 Wetlands

Biological resources warranting special protection include wetlands. Under Section 404 of the Clean Water Act, dredge or fill of wetlands is prohibited for non-water dependent projects and such actions require a permit. A wetland inventory of Redstone Arsenal, conducted by Geonex Corporation in 1995 (Redstone Arsenal 1996b), indicates there are no wetlands located on the Proposed Action site.

3.2.8 Unique Habitats

Biological resources warranting special protection include unique habitats. Under the Endangered Species Act, federal agencies are prohibited from jeopardizing or adversely modifying unique habitats. An inventory of Redstone Arsenal, conducted by the Alabama Natural Heritage Program (October 1995), indicates there are no unique habitats located on the Proposed Action site.

3.3 CULTURAL RESOURCES

3.3.1 Region of Influence

The ROI for cultural resources is the land within the limits of the Proposed Action project area.

3.3.2 Affected Environment

Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources are divided into three categories: archaeological (prehistoric and historic), historic resources and structures, and traditional (e.g., American Indians, Hawaiian, or other ethnic groups).

Prehistoric archaeological resources are defined as physical remnants of human activity that predate the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, and other evidence of prehistoric behavior.

Historic resources consist of physical properties or locations postdating the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, documents, and other evidence of human behavior. Historic resources also include locations associated with events that have made a significant contribution to history or that are associated with the lives of historically significant persons.

Traditional native resources may be prehistoric sites and artifacts, historic areas of occupation and events, historic and contemporary sacred areas, materials used to produce implements and sacred

objects, hunting and gathering areas, and other botanical, biological, and geological resources of importance to contemporary American Indian groups.

According to the RSA Contract Archaeologist, Lawrence Alexander, and Carolene Wu, of the U.S. Army Aviation and Missile Command (AMCOM) Environment and Public Works Directorate, there are no archaeological sites located in the Proposed Action area. However, Jordan Cemetery is located southeast of the Proposed Action site. A 100-foot buffer zone will be observed around the cemetery, and no activity will occur within that area. There are no standing structures located on the proposed action site.

3.4 HAZARDOUS MATERIALS AND WASTE

3.4.1 Region of Influence

The ROI for hazardous materials and waste is the land within the limits of the Proposed Action project area.

3.4.2 Affected Environment

Hazardous Materials

A variety of regulatory agencies (e.g., EPA, Department of Transportation (DOT)) have promulgated differing definitions of a hazardous material as applied to a specific situation. Of these definitions, the broadest and most applicable is the definition specified by the DOT for regulation of the transportation of these materials. As defined by the DOT, a hazardous material is a substance or material that is capable of posing an unreasonable risk to health, safety, or property when transported in commerce and has been so designated (49 CFR 171.8).

Several federal agencies oversee various aspects of hazardous material usage. The DOT regulates the safe packaging and transporting of hazardous materials, as specified in 49 CFR Parts 171 through 180 and Part 397. The Occupational Safety and Health Administration (OSHA) regulates the safe use of hazardous materials in the workplace in 29 CFR, primarily Part 1910. Environmental safety and public health issues associated with hazardous materials are regulated by the EPA through specific criteria applied to areas such as air emissions and water discharge.

Personnel who order, use, handle, store, and dispose (turn-in to DRMO) of hazardous materials or hazardous wastes are required to attend the AMCOM Environmental Institute 40-hour, Hazardous Materials and Hazardous Waste Management course.

Hazardous materials (e.g., paint, WD-40, solvents, engine oil, etc.) are stored and/or used during a variety of operations at the facility. Hazardous materials with flashpoints less than 141° F are stored inside flammable liquid safety cabinets. These materials include engine oil, grease, solvents, and other flammable items.

There are no underground storage tank sites, landfills, fuel storage sites, pesticide or herbicide storage areas, or evidence of radioactive materials storage at the proposed site.

Hazardous Waste

Waste materials (less commonly referred to as solid waste) are defined in 40 CFR 261.2 as "any discarded material (i.e., abandoned, recycled, or 'inherently waste-like')" that is not specifically excluded. This can include materials that are both solid and liquid (but containerized). Hazardous waste is further defined in 40 CFR 261.3 as any solid waste not specifically excluded that meets specific concentrations or has certain toxicity, ignitability, corrosivity, or reactivity characteristics.

Oversight of hazardous waste issues is provided primarily by the EPA (as mandated by the Resource Conservation and Recovery Act (RCRA), and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and its extension, the Superfund Amendments and Reauthorization Act (SARA)). EPA regulations are found in 40 CFR. Additional requirements are promulgated by the DOT, which regulates all transportation issues pertaining to hazardous waste. DOT requirements are found in 49 CFR.

3.5 HEALTH AND SAFETY

3.5.1 Region of Influence

The ROI for health and safety is Redstone Arsenal.

3.5.2 Affected Environment

Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect one or more of the following:

- The well-being, safety, or health of workers - Workers are considered to be persons directly involved with the operation producing the effect or who are physically present at the operational site.

- The well-being, safety, or health of members of the public - Members of the public are considered to be persons not physically present at the location of the operation, including workers at nearby locations who are not involved in the operation and the off-installation population.

The standards applicable to the evaluation of health and safety effects differ for workers and the public; thus, it is useful to consider each separately.
OSHA is responsible for protecting worker health and safety in non-military workplaces. OSHA regulations are found in 29 CFR. For Army operations, AR 385-100, *Safety*, establishes the basis for worker safety programs.

Protection of public health and safety is an EPA responsibility (mandated through a variety of laws - e.g., RCRA, CERCLA/SARA, and the CAA). EPA regulations are found in 40 CFR. Additional safety responsibilities are placed on the DOT (for transportation issues (49 CFR)), the DoD, and the Department of the Army (program requirements established in AR 385-100).

Health and safety concerns at the Proposed Action site involve the existing structures and operations. Building 4762, constructed in 1959, has an inadequate and unsafe HVAC system. In addition, due to the age of the building it is assumed to have asbestos as well as lead-based paint on the existing window frames and door trim.

3.6 INFRASTRUCTURE AND TRANSPORTATION

3.6.1 Region of Influence

The ROI for infrastructure and transportation is Redstone Arsenal.

3.6.2 Affected Environment

Infrastructure addresses those facilities and systems that provide power, water, wastewater treatment, and the collection and disposal of solid waste. Transportation addresses the modes of transportation (road, air, rail, marine) that provide circulation within and access to the Installation. For this EA, only surface road access near the proposed project area will be discussed under transportation. The reason for this is that there are no predominant rail or marine facilities at the Arsenal. Although there is an airport on the Arsenal and a helipad at the Sparkman Center, they are not extensively used as a transportation center.

3.6.3 Power

The Tennessee Valley Authority supplies electrical service to Redstone Arsenal. There are three primary substations on the Arsenal with Substation No. 12 being the closest to the proposed project area. (U.S. Army Missile Command, 1994)

North Alabama Gas provides natural gas to the area. Natural gas is used for heating and is the primary fuel supply for boilers and heating plants in the most accessible areas of the Arsenal. An interruptible supply is metered to the rest of the Arsenal. (U.S. Army Missile Command, 1994) Sufficient supplies of natural gas are available on Mills Road near Building 5410 (pers. comm. Burroughs, 2000). No. 2 fuel oil is used in the small boilers and heating plants in the isolated areas of the Arsenal (U.S. Army Missile Command, 1994).

3.6.4 Water

Redstone Arsenal obtains the majority of its water supply from the Tennessee River. Potable water is supplied from two water treatment plants located on the Arsenal. Non-potable wells are located in two areas of the Arsenal: the Visitors Control Building (Building 5105) and Test Area 3. These wells are not used as a drinking water supply, but are used to supply restrooms and for other purposes such as maintenance, floor washdowns, and livestock watering. (U.S. Army Missile Command, 1994)

A 12” cast iron water line is available from an elevated pipe just south of the Proposed Action site that will provide ample potable water for process, human consumption, and fire protection.

3.6.5 Wastewater Treatment

There are three connected wastewater systems with three primary wastewater-pumping stations located on Redstone Arsenal. These three stations pump raw sewage to the new centralized wastewater treatment plant also located on the Arsenal. Wastewater Pumping Station No. 3, located northwest of the Proposed Action area, would serve the RDEC facility and the central areas of the Arsenal. (U.S. Army Missile Command, 1994)

Wastewater and solid waste discharges at Redstone Arsenal are regulated under the National Pollutant Discharge Elimination System (NPDES) Permit Number AL0000019. This permit specifies

discharge limitations and monitoring requirements for wastewater outfall points on the Arsenal. (U.S. Army Missile Command, 1994)

Wastewater on the Arsenal is collected by 52 miles of sewer lines. All sewer lines eight inches or larger were upgraded in 1988. (U.S. Army Missile Command, 1994)

North of the Proposed Action site, a 14" existing force main for wastewater runs east and west along Fowler Road. A new lift station of sufficient head and capacity will be required to service the Proposed Action facility. A gravity line of 10" diameter is also available for use east-southeast of the Proposed Action site on Jungerman Road. (pers. comm., Burroughs, 2000)

3.6.6 Solid Waste

Redstone Arsenal operates a 70-acre permitted landfill for the disposal of inert material consisting of rocks, concrete construction materials, asphalt, and construction debris including tree stumps and asbestos (U.S. Army Missile Command, 1994). The landfill has a permit from the Alabama Department of Environmental Management (No. 45-03) that is valid until December 2000 (Redstone Arsenal, 1996b). The Arsenal's Solid Waste Disposal Facility (SWDF) permit, issued by ADEM, for its construction/demolition landfill allows the disposal of up to 600 cubic yards per day of inert materials such as construction and demolition debris, stumps, limbs, concrete, asphalt, asbestos, and similar type waste or material collected from RSA (Alabama Department of Environmental Management, 1995). At the current rate of use, the site's capacity would be sufficient for another 15 to 25 years (U.S. Army Missile Command, 1994).

All household-type trash and garbage generated on the Arsenal is hauled off-post and disposed of by the refuse collection contractor. The majority of the waste is taken to the Huntsville Solid Waste Authority Waste-to-Energy Plant that opened in 1990 adjacent to the Arsenal. (U.S. Army Missile Command, 1994)

The Proposed Action site will be added to the refuse collection schedule for solid waste disposal.

3.6.7 Transportation

Redstone Arsenal has a well-developed roadway network that allows easy access to various off-installation destinations in three directions (the Tennessee River forms the southern border of the Arsenal preventing roadway access in that direction). The major links in the network carry traffic to and from the Arsenal and serve as major arteries for traffic movement through the area.

The major north-south roads on the Arsenal are Rideout, Patton, and Toftoy. The major east-west roads are Buxton, Goss, Martin, and Redstone. All of these major roads have paved, all-weather surfaces and are in good condition. Heavy traffic flow during morning and afternoon peak travel times on Redstone Arsenal is common. (U.S. Army Missile Command, 1994)

Martin Road is the main road near the Proposed Action. Martin Road is a four- lane road that enters the Arsenal from the east at Gate 1 and from the west at Gate 7. Additional roads in the area include Fowler, Mills, Lindner, and Jungerman. These are two-lane roads that wind through existing areas. (U.S. Army Missile Command, 1994)

3.7 LAND USE

3.7.1 Region of Influence

The ROI for land use is the land within the limits of the Proposed Action project area.

3.7.2 Affected Environment

A *Real Property Master Plan, Land Use Analysis for Redstone Arsenal* was prepared for the Arsenal's Directorate of Environmental Management and Planning (now the Directorate of Environmental and Public Works (DEPW)) in April of 1999. This plan assists in planning for future growth and development, and promotes compatible and coordinated uses of land. The land on the Arsenal is divided into fourteen major use areas: family housing, troop housing, community facilities, recreation, administration, training facilities, operational facilities, operational maintenance facilities, production facilities, research and development facilities, test areas, storage, post maintenance and utilities, and the National Aeronautics and Space Administration (NASA) Marshall Space Flight Center. (DEMP, 1999)

The location of the Proposed Action site has been identified in the *Real Property Master Plan, Land Use Analysis for Redstone Arsenal* (1999) as a vacant, unconstrained buildable area. South of the Proposed Action site is a cemetery, and west of the site location is a closed sanitary landfill. The remaining land use in this area is for research and development activities. The construction of the Proposed Action facility at this site will promote the compatible and coordinated use of the land, and will include the facility in the RDEC "Corridor of Excellence."

3.8 NOISE

3.8.1 Region of Influence

The ROI for noise is the Proposed Action project area and the immediately surrounding land.

3.8.2 Affected Environment

Redstone Arsenal has developed an Installation Compatible Use Zone Program to identify noise-generating areas on the Arsenal and to minimize encroachment of noise sensitive activities both on and off the Arsenal. It is not intended to inhibit operations but to inform community officials of the expected noise generation from mission-related activities. Army facility planners work with the community governments and planning agencies to promote adequate buffer zones between the Installation's noise sources and the noise-sensitive areas. (U.S. Army Missile Command 1994)

Within the Arsenal the principal sources of noise are rocket motor flight test and static firings, warhead detonations/impacts, gun firings, demolitions, and airfield operations. Table 3-2 lists typical noise levels of principal construction equipment. Noise producing activities on the Arsenal are located such that a significant buffer zone exists between noise producing activities and the nearest population centers. The largest population densities adjacent to the Arsenal are in Huntsville on the north and east boundaries. (U.S. Army Missile Command, 1994)

Table 3-2. Typical Noise Levels of Principal Construction Equipment
Noise Levels are in dBA at 50 Feet.

Clearing		Grading and Compacting	
Bulldozer	80	Grader	80-93
Front end loader	72-84	Roller	73-95

Dump truck	83-94		
Jack hammer	81-98		
Crane with ball	75-87		
Excavation and Earth Moving		**Paving**	
Bulldozer	80	Paver	86-88
Backhoe	72-93	Truck	83-94
Front end loader	72-84	Tamper	74-77
Dump truck	83-94		
Jack hammer	81-98		
Scraper	80-93		
Structure Construction		**Landscaping and Cleanup**	
Crane	75-87	Bulldozer	80
Welding generator	71-82	Backhoe	72-93
Concrete mixer	74-88	Truck	83-94
Concrete pump	81-84	Front end loader	72-84
Concrete vibrator	76	Dump truck	83-94
Air compressor	74-87	Paver	86-88
Pneumatic tools	81-98		
Bulldozer	80		
Cement and dump trucks	83-94		
Front end loader	72-84		
Dump truck	83-94		
Paver	86-88		

Source: U.S. Environmental Protection Agency, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," NJID, 300 1, December 31, 1971.

The City of Huntsville has adopted Noise Ordinance 88-663 that regulates noise production by various sources and defines levels of ambient noise for several types of land use. City ordinances cannot be enforced outside of city limits; therefore, the city noise ordinance does not apply to Redstone Arsenal. (U.S. Army Missile Command, 1994)

The Proposed Action area is located within the acceptable noise contour zones for administrative and research and development activities. Other noise sources that may occur in the Proposed Action area would be limited to such actions as lawn mowing activities and vehicular traffic on nearby streets. (U.S. Army Missile Command, 1994)

3.9 GEOLOGY AND SOILS

3.9.1 Region of Influence

The ROI for geology and soils is the land within the Proposed Action project area.

3.9.2 Affected Environment

The bedrock geologic formations in the ROI include Monteagle Limestone, Tuscumbia Limestone and Fort Payne Chert. The Tuscumbia and Fort Payne units are often karsified in Madison County and comprise one of the best aquifers in Alabama.

Soils in the ROI form in place from the dissolution of limestone or are alluvial deposits. Soils formed in place are the insoluble component of the limestone bedrock. Above the bedrock is the unconsolidated material known as regolith. In the ROI, the regolith thickness varies from zero to 60

feet. Soil comprises the upper layer of the regolith. In the ROI, most of the surface soils belong to the Decatur-Cumberland-Abernathy Association. These soils are generally well-drained red fertile soils that are thick over limestone bedrock. They are found on nearly level to gently rolling terrain (Doyle, 1975).

In general the topography of the Proposed Action site is gently rolling with elevations primarily in the range of 600 to 650 feet above mean sea level (MSL). High areas on Redstone Arsenal include Weeden and Madkin Mountains in the north-central portion of the Arsenal with elevations reaching over 1,200 feet above MSL. The Proposed Action would occur to the south of Madkin Mountain. (U.S. Army Missile Command, 1994)

3.10 SOCIOECONOMICS

3.10.1 Region of Influence

The ROI for socioeconomics is Redstone Arsenal and the Madison County area. Socioeconomics within this EA is concerned with population, employment and housing for an area.

3.10.2 Affected Environment

Although at one time a rural town, Huntsville has emerged as a center for military and space technology with the center of activity in the region located at Redstone Arsenal. This has occurred with the consolidation of Research and Development activities for U.S. Army rocket and missile projects at the Arsenal that continues to contribute to the region's economy. (U.S. Army Missile Command, 1994)

Redstone Arsenal, as a major employer in Madison County, impacts the local economy through direct employment of civilian and military personnel as well as through the local procurement of goods and services (U.S. Army Missile Command, 1994). Direct employment by the Arsenal as well as employment directly generated from the Arsenal's procurement expenditures have led to an increase in the level of economic activity and the creation of additional employment opportunities (U.S. Army Missile Command, 1994).

3.11 WATER RESOURCES

3.11.1 Region of Influence

The ROI for water resources is Redstone Arsenal.

3.11.2 Affected Environment

Water resources include both surface water and groundwater. To protect these resources, and human health, Congress has enacted the Clean Water Act and the Safe Drinking Water Act. The EPA has also established water quality standards to protect water resources.

Surface Water

The Tennessee River forms the southern boundary of the Arsenal. Major watercourses that flow through the Arsenal include Indian Creek, Huntsville Spring Branch, and McDonald Creek. Each of

these tributaries flows generally south and empties into the Tennessee River. (U.S. Army Missile Command, 1994). There are no surface water bodies on the Proposed Action site.

Groundwater

The groundwater in local aquifers moves to lowland areas in the stream basin where it discharges through available openings and provides base flow to the local streams. The aquifers beneath Redstone Arsenal are some of the most productive in Madison County. The water is hard and alkaline with an average pH of 7.5 for groundwater in Madison County. (U.S. Army Missile Command, 1994).

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This section describes the potential environmental consequences of the proposed activities by comparing proposed project activities with the potentially affected environmental components. Sections 4.1 through 4.11 provide discussions of potential environmental consequences from the proposed activity. The amount of detail presented in each section is proportional to the potential for impacts. Sections 4.12 through 4.23 provide discussions of the following with regard to proposed project actions: individuals/organizations responsible for obtaining required permits/licenses/entitlements, cumulative impacts, mitigation measures, conflicts with federal land use plans, policies, and controls, energy requirements and conservation potential, natural or depletable resource requirements and conservation potential, irreversible or irretrievable commitment of resources, biological diversity, adverse environmental effects that cannot be avoided, the relationship between the short-term uses of the human environment and the maintenance and enhancement of long-term productivity, federal actions to address environmental justice in minority populations and low-income populations, and conditions normally requiring an environmental impact statement.

To assess the potential for and significance of environmental impacts from the proposed project activities, a list of activities necessary to accomplish the Proposed Action was first developed (Sections 1.0 and 2.0). Then the environmental setting was described, with emphasis on any environmentally sensitive areas (Section 3.0). Next, the program activities were compared with the potentially affected environmental components to determine the environmental impacts of the Proposed Action.

Federal environmental laws and regulations were reviewed to assist in determining established thresholds for assessing environmental impacts (if any) in fulfillment of NEPA requirements. Proposed activities were evaluated to determine their potential to result in significant environmental consequences using an approach based on the interpretation of significance outlined in the CEQ regulations for implementing the procedural provisions of the NEPA (40 CFR 1500-1508) and AR 200-2, *Environmental Effects of Army Actions* (U.S. Department of the Army, 1988).

Guidelines established by the CEQ (40 CFR 1508.27) specify that significance should be determined in relationship to both context and intensity (severity). The assessment of potential impacts and the determination of their significance are based on the requirements in 40 CFR 1508.27. Three levels of impact can be identified:

- No Impact - No impact is predicted
- Not Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource

4.1 AIR QUALITY

Criteria pollutants are those chemicals for which ambient air quality standards have been promulgated. These criteria pollutants are emitted primarily from combustion sources such as power plants, boilers, aircraft engines, automotive engines, solid waste incinerators, and burn pits. These pollutants are regulated and controlled so that the concentration does not exceed either short-term or long-term standards. Under the CAA, federal actions must not cause or contribute to any new

violation of air quality standards, increase the frequency or severity of any existing violation, or delay the timely attainment of any air quality standard or interim milestone.

Non-criteria pollutants are all other air pollutants that are regulated and controlled by emission standards or other health-risk-based criteria. As the EPA promulgates the various portions mandated by the 1990 CAA Amendments, the number of regulated pollutants has continued to grow. These pollutants may be emitted from many different sources, such as the use of solvents in paint, automobile maintenance, and metals and organic emissions from solid waste incineration activities.

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to air quality.

4.1.1 Proposed Action

Air quality impacts could occur during the construction and operation of the facility associated with the Proposed Action. Intermittent construction-related impacts could result from fugitive dust (particulate matter) and construction equipment emissions.

Fugitive dust and combustive emissions would be generated during construction activities. A conservative estimate for uncontrolled fugitive dust (particulate matter) emissions from ground-disturbing activities is 1.2 tons per acre per month of activity. Normally, half of these emissions are assumed to be PM-10.

Combustion emissions would be generated during construction by the internal combustion engines of heavy construction vehicles and equipment. The main emissions from heavy-duty construction equipment are carbon monoxide, hydrocarbons, nitrogen oxides, aldehydes, sulfur oxides, and particulate. The EPA has tabulated estimates of the amounts of these pollutants emitted for numerous categories of heavy construction vehicles and equipment based on either the number of hours of operation or the amount of fuel consumed.

Some air emissions would be generated during the operational activities. Volatile vapors from the painting operations would be emitted. However, all painting activities would occur inside a paint booth outfitted with air filters and ventilation mechanisms. It is anticipated that there would be no increase in emissions from the current amount generated and would therefore generate no impact since a change would not occur.

Projected impacts to air quality from construction activities are not expected to be significant because fugitive dust and combustion emissions would be kept below the regulated amounts shown in Section 3.1. Therefore, the emissions are not expected to contribute to the long-term air quality in the area.

4.1.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present. There would be no impacts to air quality since no change would occur.

4.1.3 Cumulative Impacts

No cumulative air quality impacts are anticipated for the Proposed Action in combination with other activities in the area. The Proposed Action would take place in a small area with minimal amounts of activity occurring at any one time.

4.1.4 Mitigation Measures

Construction-related emissions of fugitive dust and exhaust products would depend on the amount of earthwork to be done at the site location and the construction mobilization schedule. Fugitive dust from ground-disturbing activities can be reduced up to 50 percent by regular site-watering practices as necessary. The volatile vapors emitted during the painting process can be vented through the paint booths.

4.2 BIOLOGICAL RESOURCES

Criteria for determining the significance of potential impacts to biological resources are based on the importance of the resource, the number or amount of the resource that would be impacted, the sensitivity of the resource to the proposed activities, and the duration of the impact. Impacts are considered significant if they are determined to have the potential to result in reduction of the population size of federally listed or state-listed threatened or endangered species, degradation of biologically important unique habitats, or substantial long-term loss of vegetation and the capacity of a habitat to support wildlife (i.e. negatively impact biodiversity).

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to biological resources.

4.2.1 Proposed Action

Vegetation

The immediate construction area for the Proposed Action consists predominantly of pine trees of various ages. Some hardwood stands exist on the outer boundary of the construction area of the Proposed Action. Prior to construction, the pine timber stand would be available for harvest. During construction activities, existing trees located on the site of the Proposed Action would be saved if their trunks are five inches in diameter or greater and they are determined to be healthy. All other trees that are not harvested would be saved if they do not interfere with planned construction. Trees to be saved would have three stakes at least ten feet away from the trunks with barrier flagging stretched around all three to protect the trees from construction equipment. None of the hardwood trees would be removed from the site. Projected impacts to these biological resources from construction activities are not expected to be significant if the mitigation measures proposed in this document are implemented. Construction activities are not expected to contribute to the long-term cumulative impacts on these biological resources of the area.

Fish and Wildlife

Vista Technologies Inc. conducted a site survey over the area considered for the Proposed Action. This area is a field of pines with hardwood stands bordering the northern boundary of the area. Suitable habitat for a variety of wildlife species is present in the area of the Proposed Action, however the site of the Proposed Action does not appear to support extensive wildlife. The wide range of terrestrial and aquatic habitats, and the large size of the Arsenal, results in the use of the area by

various wildlife species. Various wildlife such as deer, rabbit, or fox are occasionally sighted as they transit the Arsenal. More than 250 species of birds are known to occur on the Arsenal and do transit the area occasionally. Large nesting colonies are not prevalent.

The closest aquatic resource to the Proposed Action site is HSB, located approximately 1 mile to the south of the construction site. Therefore, there are no fish or other aquatic life on the Proposed Action site. (U.S. Army Missile Command, 1994)

The available habitat was suitable for a variety of common forest wildlife. No species were observed during the site visit. However, common forest species such as small mammals and birds are expected to inhabit the area. A detailed description of bird and other wildlife species that have the potential to exist in the Proposed Action area can be found in the Natural Resources Management Plan for Redstone Arsenal (U.S. Army Missile Command, 1995). Since the Proposed Action area does not appear to support extensive wildlife habitat, and because the closest aquatic resource (HSB) is approximately 1 mile south of the proposed construction site, no significant impacts are expected to these biological resources.

Aquatic Habitats

The closest aquatic resource to the Proposed Action site is HSB located approximately 1 mile to the south of the proposed construction site on Fowler Road. Implementation of best management practices by the construction contractors (e.g., silt fencing, hay bales) would mitigate any potential impacts. Since the Proposed Action site does not contain any permanent pools, ponds, streams, or lakes and does not support habitat for aquatic organisms, there are no impacts expected to these biological resources.

Threatened and Endangered Species

According to information collected by the Alabama Natural Heritage Program (October 1995), there are no threatened or endangered species located on the Proposed Action site. The U.S. Fish and Wildlife Service has been contacted for input on potential threatened or endangered species or their habitats on the Proposed Action site. Since there are no threatened or endangered plant or animal species located on the Proposed Action site no impacts to these biological resources would be anticipated.

Unique Habitats

According to information collected by the Alabama Natural Heritage Program (October 1995), there are no unique habitats located on the Proposed Action site. Since there are no unique habitats located on the Proposed Action site there would be no impacts anticipated to these biological resources.

Wetlands

According to information collected during a wetland inventory of Redstone Arsenal by Geonex Corporation in 1995, there are no wetland areas located on the Proposed Action site. Therefore, there would be no impacts to wetlands from the Proposed Action. Wetlands located at WNLWR approximately ½ mile downstream and beyond of the proposed action site would be protected from non-point source pollution caused by erosion and sedimentation through the implementation of best management practices.

4.2.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present. There would be no impacts to biological resources since no change would occur.

4.2.3 Cumulative Impacts

No cumulative biological resources impacts are anticipated for the Proposed Action in combination with other activities in the area. The Proposed Action would take place in a small area with minimal amounts of activity occurring at any one time.

4.2.4 Mitigation Measures

During construction activities, best management practices for erosion control (e.g., silt fencing, hay bales) would be followed by the selected building contractor. Existing trees located on the site of the Proposed Action would be saved if their trunks are five inches in diameter or greater and they are determined to be healthy. All other trees would be saved if they do not interfere with planned construction. Trees to be saved would be staked at least ten feet away from the trunks; the process would consist of three stakes with barrier flagging stretched around all three to protect the trees from construction equipment. The construction would not extend beyond the existing cleared and maintained lawns and common areas.

4.3 CULTURAL RESOURCES

Cultural and archaeological resources are limited, nonrenewable resources whose potential for scientific research or value as a traditional resource may be easily diminished by actions, which significantly impact the integrity of the property. Activities that disturb the ground in which an archaeological site is present can destroy temporally and culturally diagnostic artifacts and features or alter artifact provenance. Such alterations to the property's integrity preclude possible determinations that the site may be likely to yield information important in prehistory or history. Significance of impacts is determined by the intensity and context of the alteration of the distinctive characteristics and integrity of a property.

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to cultural resources.

4.3.1 Proposed Action

The DEPW has performed an archaeological reconnaissance on the RDEC Facility site proposed for construction. It was determined that no archaeological sites were found in the Proposed Action area, and these findings were coordinated with the Alabama State Historic Preservation Office (Appendix A). There are no buildings eligible for the National Register of Historic Places (NRHP) in the project area. Jordan Cemetery is located southeast of the Proposed Action area, and a 100-foot buffer zone has been established around the cemetery. By observing this buffer zone, construction and operational activities would not disturb any cultural resources at the cemetery. Therefore, there would be no anticipated impacts to cultural resources.

If, during construction activities, the selected contractor observes items that might have historical or archaeological value, such observations shall be reported immediately to the Cultural Resources Manager so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The construction contractor shall cease all activities that may result in the destruction of these resources and shall prevent employees from trespassing on, removing, or otherwise damaging such resources.

4.3.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present. There would be no impacts to cultural resources since no change would occur.

4.3.3 Cumulative Impacts

Since no cultural resource impacts have been identified for the Proposed Action, the potential for incremental, cumulative impacts does not exist.

4.3.4 Mitigation Measures

Since no cultural resource impacts have been identified for the Proposed Action, no mitigation measures are necessary.

If, however, during construction activities, the selected contractor discovers items that might have historical or archaeological value, such discoveries shall be reported immediately to the Army so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The construction contractor shall cease all activities that may result in the destruction of these resources and shall prevent employees from trespassing on, removing, or otherwise damaging such resources.

4.4 HAZARDOUS MATERIALS AND WASTE

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to hazardous materials and waste.

4.4.1 Proposed Action

No hazardous materials would be used during the construction activities, and a limited amount of hazardous materials would be used during normal operations at the facilities. Solvents such as lacquer thinner and mineral spirits would be used as well as conformal coating and epoxy paints. Hazardous waste impacts could occur during the construction and operation of the facility associated with the Proposed Action. Construction activities are not expected to use hazardous materials. Pesticides and herbicides would continue to be periodically applied at the site in normal lawn care operations.

Any hazardous waste would be identified, removed in accordance with current regulations, and disposed of following existing regulations. According to DEMP records, there was no hazardous waste from these RDEC operations turned in for disposal during CY 99 (U.S. Army Aviation and Missile Command, 1999). No hazardous waste would be disposed of on-site. Construction contractors would avoid disturbing waste buried in the adjacent, closed landfill, RSA-55.

Construction contractors would have the option of disposing of all other construction-related debris on or off the Arsenal.

Projected impacts from hazardous materials and waste from construction and operational activities are expected to be not significant because disposal of all debris and waste would be completed in compliance with current regulations. No hazardous materials or waste would be disposed of on-site. These activities are not expected to contribute to the long-term cumulative impacts to hazardous materials and waste.

4.4.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present. There would be no impacts to hazardous materials and waste since no change would occur.

4.4.3 Cumulative Impacts

The quantities of hazardous waste that would be produced by the Proposed Action activities do not represent a significant increase in either the quantities or types of hazardous waste compared to current practice. Therefore, no significant impact to the environment is expected. No cumulative hazardous materials/waste impacts are anticipated for the Proposed Action in combination with other activities in the area. The Proposed Action would take place in a small area with minimal amounts of activity occurring at any one time.

4.4.4 Mitigation Measures

Any hazardous waste would be identified, removed in accordance with current regulations, and disposed of following existing regulations. No hazardous waste would be disposed of on-site. Construction contractors would have the option of disposing of all other construction-related debris activities on or off the Arsenal.

4.5 HEALTH AND SAFETY

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to health and safety.

4.5.1 Proposed Action

Health and safety impacts could occur due to construction and operational activities at the site of the Proposed Action. Using established safety procedures would minimize potential impacts to health and safety from Proposed Action activities. These include Army Regulation 385-100, *Safety*, and all appropriate OSHA regulations including 29 CFR Part 1926, *Safety and Health Regulations for Construction*, that would be followed during the course of all construction activities. The selected building contractor would obtain a NPDES construction permit from the Alabama Department of Environmental Management. The selected building contractor would comply with the NPDES construction permit requirements as well as all applicable federal, state, and local laws and regulations during construction. The building tenants would comply with all applicable federal, state, and local laws and regulations during operations.

There would be potential positive, though not significant, impacts to health and safety due to the construction of the new facility because it would have a new electrical system, a new HVAC system, and no asbestos or lead-based paint on the structure that could cause a health and safety hazard.

4.5.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present. Building 4762 is rapidly deteriorating and cannot be economically repaired, and occupational health directives have mandated the replacement/upgrade of the existing HVAC system in this building. Since the building would remain, there would be no change to the general types of activities in the area. However, Building 4762 has outdated electrical systems, asbestos, and is assumed to have lead-based paint on the existing window frames and door trim that could cause a health and safety hazard. The No Action Alternative would result in potential negative impacts to health and safety because of the deteriorated condition of Building 4762.

4.5.3 Cumulative Impacts

No cumulative health and safety impacts are anticipated for the Proposed Action in combination with other activities in the area. The Proposed Action would take place in a small area with minimal amounts of activity occurring at any one time.

4.5.4 Mitigation Measures

Impacts to health and safety from Proposed Action activities would be minimized by using established safety procedures such as AR 385-100, *Safety*, and all appropriate OSHA regulations including 29 CFR Part 1926, *Safety and Health Regulations for Construction*. The selected building contractor would obtain a NPDES construction permit from the Alabama Department of Environmental Management. The selected building contractor would comply with the requirements of the NPDES construction permit as well as all applicable federal, state, and local laws and regulations when constructing any structures. The building tenants would comply with all applicable federal, state, and local laws and regulations during the operation of the facility.

4.6 INFRASTRUCTURE AND TRANSPORTATION

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to infrastructure and transportation.

4.6.1 Proposed Action

Infrastructure and transportation impacts could occur during construction and operation of the facility associated with the Proposed Action. However, these impacts are not considered significant. Overall these impacts would be anticipated to be positive impacts because of the expected improvement of roads and utilities.

Infrastructure impacts could also occur, however, due to periodic short-term interruptions in service the new facility is constructed. The existing transportation (roadway) system would be adequate to serve the proposed development but could have short-term interruptions in use as construction

activities occur. The contractor has the option of using the existing roadway pattern or designing a new system. If changes occur, interruptions to service would be likely. These short-term interruptions in service are not considered significant impacts.

Projected impacts to infrastructure and transportation from construction and operational activities are expected to not be significant because the concerns regarding utility and traffic rerouting and the short-term interruptions in service can be mitigated. These activities are not expected to contribute to the long-term cumulative impacts on infrastructure and transportation in the area.

4.6.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present. There would be no impacts to infrastructure and transportation since no change would occur.

4.6.3 Cumulative Impacts

No other activities have been identified that, together with the Proposed Action, would have the potential for cumulative impacts on infrastructure and transportation.

4.6.4 Mitigation Measures

Scheduled interruptions to utility service or the roadway system within the Proposed Action area would need to be scheduled in advance.

4.7 LAND USE

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to land use.

4.7.1 Proposed Action

There would be no impacts to land use due to the construction and operation of the facility associated with the Proposed Action. The Proposed Action site location has been identified as a vacant, unconstrained buildable area by the *Real Property Master Plan, Land Use Analysis, Redstone Arsenal, Alabama* (1999), and is consistent with current Installation land use plans.

4.7.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present. There would be no impacts to land use since no change would occur.

4.7.3 Cumulative Impacts

Since no land use impacts have been identified for the Proposed Action, the potential for incremental, cumulative impacts does not exist.

4.7.4 Mitigation Measures

Since no land use impacts have been identified for the Proposed Action, no mitigation measures are necessary.

4.8 NOISE

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to noise.

4.8.1 Proposed Action

The site location associated with the Proposed Action is located within the acceptable noise contour zones for activities taking place on the Arsenal. Noise sources that may occur as a result of the Proposed Action include construction and operational activities such as construction and facility vehicle traffic. Projected noise impacts from construction and operational activities are not expected to be significant because reductions in noise activities and confinement of noise producing activities to normal workday hours can be easily mitigated.

4.8.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they currently are. There would be no impacts to noise issues since no change would occur.

4.8.3 Cumulative Impacts

No other activities have been identified that, together with the Proposed Action, would have the potential for cumulative noise impacts.

4.8.4 Mitigation Measures

Confining noise-producing activities to normal working hours can mitigate noise impacts from construction and operational activities.

4.9 GEOLOGY AND SOILS

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to geology and soils.

4.9.1 Proposed Action

There would be no significant impacts anticipated to geology or soils from the Proposed Action. Best management practices for erosion control, topsoil management and revegetation would be required and stated in the construction contract. Erosion control during construction activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils into drainage ditches or low-lying areas leading to WNWLR. The contractor selected for this effort would determine site-specific geotechnical conditions.

4.9.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present. There would be no impacts to geology and soils since no change would occur.

4.9.3 Cumulative Impacts

Since there are no other known actions planned for the Proposed Action site, there are no known cumulative impacts.

4.9.4 Mitigation Measures

Soils that were disturbed during construction activities would be revegetated. Erosion control during construction activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils into drainage ditches or low-lying areas.

4.10 SOCIOECONOMICS

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to socioeconomics.

4.10.1 Proposed Action

Impacts to socioeconomics would be slightly positive due to the construction and operation of the RDEC facility. Also, the construction work would have a potentially positive impact on the local economy. The population of the overall area would not be affected (because there would be no population in-migration), and the regional employment outlook and area income would improve slightly due to this construction project.

4.10.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present; they would be put to no further use once vacated. Building 4762, constructed in 1959, is considered to be rapidly deteriorating and cannot be economically repaired. Since the existing buildings would remain, there would be no change to the general types of activities in the area. In addition, the population of the area and regional employment would not change significantly. This would not result in significant impacts to socioeconomics.

4.10.3 Cumulative Impacts

No cumulative socioeconomic impacts are anticipated for the Proposed Action in combination with other activities in the area. The Proposed Action would take place in a small area with minimal amounts of activity occurring at any one time.

4.10.4 Mitigation Measures

Since socioeconomics impacts have been identified as not significant or positive for the Proposed Action, no mitigation measures are necessary.

4.11 WATER RESOURCES

The following sections describe the impacts to the environment from the Proposed Action, impacts to the environment from the alternatives to the Proposed Action including the No Action Alternative, cumulative impacts, and potential mitigation measures pertaining to water resources.

4.11.1 Proposed Action

There would be no impacts expected to groundwater resources due to the construction and operation of the RDEC facility. Erosion control during construction activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils via surface waters and mitigate the potential damage.

4.11.2 No Action Alternative

If the No Action Alternative were chosen, it would require that the Army leave the existing operations as they are at present. There would be no impacts to water resources since no change would occur.

4.11.3 Cumulative Impacts

No other activities have been identified that, together with the Proposed Action, would have the potential for cumulative impacts to water resources.

4.11.4 Mitigation Measures

Erosion control during construction activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils via surface waters.

4.12 INDIVIDUALS/ORGANIZATIONS RESPONSIBLE FOR OBTAINING REQUIRED PERMITS/LICENSE/ENTITLEMENTS

The selected building contractor would obtain a NPDES construction permit from the Alabama Department of Environmental Management. The selected building contractor would comply with the requirements of this NPDES construction permit, as well as all applicable federal, state, and local laws and regulations during construction.

4.13 CUMULATIVE IMPACTS

No cumulative impacts are anticipated for the Proposed Action in combination with other activities in the area.

4.14 MITIGATION MEASURES

Mitigation measures for the Proposed Action are not required for land use and socioeconomics because no impacts requiring mitigative measures have been identified for these resources. Mitigation measures for the remaining resources are summarized below.

Air Quality

Construction-related emissions of fugitive dust and exhaust products would depend on the amount of earthwork to be done at the site location and the construction mobilization schedule. Fugitive dust from ground-disturbing activities can be reduced up to 50 percent by regular site-watering practices as necessary.

Biological Resources

During construction activities, the selected building contractor would follow best management practices for erosion control during construction activities. The pine timber stands would be harvested. The remaining trees located on the site of the Proposed Action would be saved if their trunks are five inches in diameter or greater and they are determined to be healthy. All other trees would be saved if they do not interfere with planned construction. Trees to be saved would be staked at least ten feet away from the trunks; the process would consist of three stakes with barrier flagging stretched around all three to protect the trees from construction equipment. Implementation of best management practices would mitigate potential impacts to biological resources on WNWLR.

Cultural Resources

If, during construction activities, the selected contractor discovers items that might have historical or archaeological value, such discoveries shall be reported immediately to the Army so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. All construction and operational activities would observe a 100-foot buffer zone around Jordan Cemetery, located southeast of the Proposed Action area. The construction contractor shall cease all activities that may result in the destruction of any cultural resources and shall prevent employees from trespassing on, removing, or otherwise damaging such resources.

Hazardous Materials and Waste

Any hazardous waste generated during the project would be identified, removed in accordance with current regulations, and disposed of following existing regulations. No hazardous waste would be disposed of on-site. The construction contractor would have the option of disposing of construction-related debris from construction activities on or off the Arsenal.

Health and Safety

Impacts to health and safety from Proposed Action activities would be minimized by using established safety procedures such as AR 385-100, *Safety*, and all appropriate OSHA regulations including 29 CFR Part 1926, *Safety and Health Regulations for Construction*. The selected building contractor would comply with all applicable federal, state, and local laws and regulations.

Infrastructure and Transportation

Scheduled interruptions to utility service or the roadway system within the Proposed Action area would need to be scheduled in advance.

Noise

Confining noise-producing activities to normal working hours can mitigate noise impacts from construction and operational activities.

Geology and Soils

Soils that were disturbed during construction activities would be revegetated. Erosion control during construction activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils into drainage ditches or low-lying areas.

Water Resources

Erosion control during construction activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils via surface waters. The selected building contractor would obtain a NPDES construction permit from the Alabama Department of Environmental Management. The selected building contractor would comply with the requirements of the NPDES construction permit, as well as all applicable federal, state, and local laws and regulations

4.15 CONFLICTS WITH FEDERAL, STATE, OR LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The Facility Construction and Operation of the Redstone Arsenal Test and Evaluation Lab Support Facility project would have no impact on existing land use itself and present no conflicts with federal, regional, state, or local land use plans, policies, or controls.

4.16 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Anticipated energy requirements of program activities can be accommodated within the energy supply of the region. Energy requirements would be subject to any established energy conservation practices. The use of energy would most likely be reduced due to more efficient buildings, appliances, and heating and cooling units.

4.17 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL

Other than the use of necessary building materials and vehicle fuels, no significant use of natural or depletable resources is required by the project.

4.18 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

The amount of building materials and energy required for this program is small. Although the proposed activities would result in some irreversible and irretrievable commitment of resources such as wood, concrete, minerals, and labor, this commitment of resources is not significantly different from that necessary for many other similar building programs. It is similar to the building activities that have been carried out on Redstone Arsenal over recent years.

4.19 BIOLOGICAL DIVERSITY

Biological diversity (biodiversity), or the variety of life and its processes, is a basic property of nature that provides enormous ecological, economic, and aesthetic benefits. The loss of biodiversity is recognized as a major national as well as global concern with potentially profound ecological and economic consequences.

Conservation of biodiversity is a national goal provided for in the framework of NEPA. This goal is to anticipate and evaluate the effects of federal actions on biodiversity and actively manage for the reduction of the impact of these effects as well as the promotion of restoration to previously impacted areas.

The basic goal of biodiversity conservation is to maintain naturally occurring ecosystems, communities, and native species. For the Proposed Action evaluated in this EA, impacts to the biodiversity of the ROI would not be significant. However, several strategies exist for increasing biodiversity in these areas. These strategies include:

- Incorporate measures to minimize landscape fragmentation.
- Link blocks of originally connected habitat through landscape corridors.
- Utilize only native species in landscape plantings.
- Monitor for biodiversity impacts and for changes in biodiversity.

Implementation of as many of these strategies as feasible during the project planning and design phase would enhance the biodiversity of the Proposed Action area and RSA as a whole.

4.20 ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Adverse environmental effects that cannot be avoided include fugitive dust (particulate matter) and construction equipment emissions; some destruction of existing vegetation; noise from construction and operational activities; and the disturbance of soils. However, through implementation of the program actions and mitigations described within this document, these effects can be minimized.

4.21 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The Proposed Action would be undertaken in accordance with the Redstone Arsenal Master Plan EA (U.S. Army Missile Command 1994) that provides a management tool to aid in making operational support decisions by incorporating the concept of comprehensive planning.

4.22 FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY AND LOW-INCOME POPULATIONS

The Proposed Action would be undertaken in a manner that would not substantially affect human health or the environment. The activities would also be conducted in a manner that would not exclude persons from participation in, deny persons the benefits of, or subject persons to discrimination under, the project actions because of their race, color, or national origin.

4.23 CONDITIONS NORMALLY REQUIRING AN ENVIRONMENTAL IMPACT STATEMENT

The potential impacts arising from the proposed Facility Construction and Operation of the Redstone Arsenal Test and Evaluation Lab Support Facility project were evaluated specifically in the context of the criteria for actions requiring an Environmental Impact Statement described in DoD Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions* (U.S. Department of Defense, 1979), and AR 200-2, *Environmental Effects of Army Actions* (U.S. Department of the Army, 1988).

Specifically, the proposed project activities were evaluated for their potential to:

- significantly affect environmental quality or public health and safety;
- significantly affect historic or archaeological resources, public parks and recreation areas, wildlife refuge or wilderness areas, wild and scenic rivers, or aquifers;
- adversely affect properties listed or meeting the criteria for listing on the National Register or the National Registry of Natural Landmarks;
- significantly affect prime and unique farmlands, wetlands, ecologically or culturally important areas, or other areas of unique or critical environmental concern;
- result in significant and uncertain environmental effects or unique or unknown environmental risks;
- significantly affect a species or habitat listed or proposed for listing on the federal list of endangered or threatened species;
- establish a precedent for future actions;
- adversely interact with other actions resulting in cumulative environmental effects; and
- involve the use, transportation, storage, and disposal of hazardous or toxic materials that may have significant environmental impact.

The evaluation indicated that the proposed Facility Construction and Operation of the Redstone Arsenal Test and Evaluation Lab Support Facility project activities, as described in this EA, did not meet any of these criteria and therefore, the development of an Environmental Impact Statement is not warranted.

CHAPTER 5 CONCLUSIONS

The impact to the environment for the proposed Facility Construction and Operation of the Redstone Arsenal Test and Evaluation Lab Support Facility project has been assessed. The previous chapter discussed the environmental consequences of each alternative highlighted within this EA. Table 5-1 provides a comparison of the environmental consequences associated with the implementation of each alternative by individual resource. As outlined in Section 4.0, three levels of impact are defined as follows:

- No Impact - No impact is predicted.
- No Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource.
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource.

Table 5-1. Comparison of Environmental Consequences

RESOURCE	PROPOSED ACTION	NO-ACTION ALTERNATIVE
Air Quality	**X**	**--**
Biological Resources	**X**	**--**
Cultural Resources	**--**	**--**
Hazardous Materials and Waste	**X**	**--**
Health and Safety	**X**	**O**
Infrastructure and Transportation	**X**	**--**
Land Use	**--**	**--**
Noise	**X**	**--**
Geology and Soils	**X**	**--**
Socioeconomics	**+**	**X**
Water Resources	**X**	**--**

+ - Positive Impact
-- - No Impact
X - No Significant Impact
O - Significant Impact

5.1 ALTERNATIVE 1 - PROPOSED ACTION

The most beneficial alternative, using information supplied by the U.S. Army Redstone Arsenal Master Planning Office, is Alternative 1 - Proposed Action. There are no significant impacts to the environmental resources under this alternative, and the potential impacts to the environment that were determined are considered to be not significant and mitigable. In addition, there are no cumulative impacts under this alternative.

5.2 NO ACTION ALTERNATIVE

The No Action Alternative would require that the Army not plan for the future development and modernization of Prototype and Fabrication Engineering facilities. These RDEC operations would continue without the benefits afforded by comprehensive planning and the proposed action. Existing

operations at these RDEC facilities would continue as scheduled in seven separate buildings. Under the No-Action Alternative, the personnel in the Prototype Engineering Facility would be subjected to potential impacts to health and safety due to the deteriorating conditions of Building 4762. Additionally, excessive maintenance and energy costs would escalate to the detriment of mission accomplishment. Personnel morale would be compromised, and there would be a continued loss of valuable personnel time due to travel among the buildings.

5.3 RATIONALE FOR FINDING OF NO SIGNIFICANT IMPACTS

Impacts to the environment from the Proposed Action, and the reasons that these impacts are found to be not significant, are listed below for each resource.

Air Quality

Impacts include construction-related emissions of fugitive dust and exhaust products during construction. Additionally, emissions would be generated from painting operations. Fugitive dust from ground-disturbing activities can be reduced up to 50 percent by regular site-watering practices as necessary, and all painting operations would be performed in a paint booth equipped with air filters and ventilation mechanisms.

Biological Resources

Impacts include the potential destruction of trees for the planned construction area. Existing pine trees located on the site of the Proposed Action would be harvested prior to construction. The remaining trees would be saved if their trunks are five inches in diameter or greater and they are determined to be healthy. All other trees would be saved if they do not interfere with planned construction. Trees to be saved would be staked at least ten feet away from the trunks; the process would consist of three stakes with barrier flagging stretched around all three to protect the trees from construction equipment. The construction would not extend into the hardwood stands north of the Proposed Action area. In addition, implementation of best management practices by the construction contractors (e.g., silt fencing, hay bales) would mitigate impacts to water resources on WNWLR. Drip pans are also placed under vehicles stored in the motor park as a precautionary measure and to avoid any soil and groundwater contamination from leaking vehicles.

Cultural Resources

There are no impacts expected to cultural resources from the Proposed Action. A 100-foot buffer zone will be observed around Jordan Cemetery, located south of the Proposed Action area. If, during construction activities, the selected contractor discovers items that might have historical or archaeological value, such discoveries shall be reported immediately to the Army so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The construction contractor shall cease all activities that may result in the destruction of these resources and shall prevent employees from trespassing on, removing, or otherwise damaging such resources.

Hazardous Materials and Waste

Any hazardous waste would be identified, removed in accordance with current regulations, and disposed of following existing regulations. No hazardous waste would be disposed of on-site. The construction contractor would have the option of disposing of all other construction-related debris from demolition activities on or off the Arsenal.

Health and Safety

There is the potential for health and safety impacts to workers at the site of the Proposed Action. Impacts to health and safety from Proposed Action activities would be minimized by using established safety procedures such as AR 385-100, *Safety*, and all appropriate OSHA regulations including 29 CFR Part 1926, *Safety and Health Regulations for Construction*. The selected building contractor would comply with all applicable federal, state, and local laws and regulations when constructing any structures.

Infrastructure and Transportation

Impacts include interruptions to utility service or the roadway system in the Proposed Action area. Scheduled interruptions to utility service or the roadway system would need to be scheduled in advance.

Land Use

There are no impacts expected to land use from the Proposed Action. The Proposed Action is consistent with current Installation land use plans (U.S. Army Missile Command, 1994).

Noise

Impacts include construction and operational activities and related vehicle traffic. Noise impacts from construction and confining noise-producing activities to normal working hours can mitigate operational activities.

Geology and Soils

Impacts include soil disturbance during construction activities. Soils that were disturbed during construction activities would be revegetated. Erosion control during construction activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils into drainage ditches or low-lying areas.

Socioeconomics

There are slightly positive impacts expected to socioeconomics from the Proposed Action. The positive impacts come from an increase in employment opportunities and from a slightly improved local economy.

Water Resources

Impacts include the movement of soil during construction activities due to surface water activity. Erosion control during construction activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils via surface waters. The selected building contractor would obtain a NPDES construction permit from the Alabama Department of Environmental Management. The selected building contractor would comply with the requirements of the NPDES construction permit, as well as all applicable federal, state, and local laws and regulations.

CHAPTER 6 LIST OF PREPARERS

Larry W. Blackwell
Director, Environmental Programs
M.A., Human Relations, Louisiana Tech University, 1988
BFA, Advertising, Louisiana Tech University, 1971

Danny Brandon
Environmental Specialist
A.S. Bioenvironmental Engineering Technology
Community College of the Air Force, 1997

Susan Pearsall
Senior Environmental Scientist
M.S., Biology, University of Alabama in Huntsville, 1999
B.S., Zoology, Auburn University, 1993

Jeffery H. Scott, Ph.D.
Senior Fish and Wildlife Biologist
Ph.D., Aquatic Ecology/Limnology, Auburn University, 1990
M.S., Biology, Jacksonville State University, 1982
B.S., Biology, Jacksonville State University, 1977

CHAPTER 7 INDIVIDUALS/AGENCIES CONSULTED

7.1 AGENCIES/ORGANIZATIONS SENT COPIES OF THE ASSESSMENT

As part of the CEQ Regulations on the National Environmental Policy Act, the U.S. Army Aviation and Missile Command is circulating the Environmental Assessment for the Facility Construction and Operations of the Redstone Arsenal RDEC Test and Evaluation Lab Support Facility to the following agencies, organizations, and individuals:

Alabama State Historic Preservation Office (ALSHPO), Montgomery, Alabama

U.S. Army Materiel Command

U.S. Army Aviation and Missile Command, Directorate of Environment and Public Works, Natural Resources Team, Redstone Arsenal, Alabama

U.S. Army Aviation and Missile Command, Directorate of Environment and Public Works, Master Planning Division, Redstone Arsenal, Alabama

U.S. Fish and Wildlife Service, Ecological Services Division, Daphne, Alabama

7.2 INDIVIDUALS AND AGENCIES CONTRIBUTING TO THE PROJECT

Daniel J. Dunn, Environmental Protection Specialist, U.S. Army Aviation and Missile Command, Directorate of Environment and Public Works, Redstone Arsenal, Alabama

Larry E. Goldman, U.S. Fish and Wildlife Service

Greg Rhinehart, Alabama State Historic Preservation Office

Mark Burroughs, General Engineer, U.S. Army Aviation and Missile Command, Directorate of Environment and Public Works, Redstone Arsenal, Alabama

Susan F. Weber, Environmental Protection Specialist, U.S. Army Aviation and Missile Command, Directorate of Environment and Public Works, Redstone Arsenal, Alabama

Carolene Wu, Environmental Protection Specialist, U.S. Army Aviation and Missile Command, Directorate of Environment and Public Works, Redstone Arsenal, Alabama

CHAPTER 8 REFERENCES

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Wu, Carolene, 1996. Personal communication between Wu, Environmental Protection Specialist, U.S. Army Aviation and Missile Command, Directorate of Environment and Public Works, Redstone Arsenal, and Vista Technologies, regarding cultural resources on Redstone Arsenal. February 13.

LIST OF ACRONYMS AND ABBREVIATIONS

AMCOM	Army Aviation and Missile Command
AR	Army Regulation
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
dBA	A-weighted Decibels
DEPW	Directorate of Environment and Public Works
DoD	Department of Defense
DOT	Department of Transportation
EA	Environmental Assessment
EPA	Environmental Protection Agency
HSB	Huntsville Spring Branch
HVAC	Heating, Ventilating and Air-Conditioning
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO2	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	Ozone
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PM 2.5	Particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
PM-10	Particulate matter with an aerodynamic diameter less than or equal to 10 microns
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SO_2	Sulfur Dioxide
USFWS	United States Fish and Wildlife Service
WNWLR	Wheeler National Wildlife Refuge